Australian Government
Australian Transport Safety Bureau

ATSB TRANSPORT SAFETY INVESTIGATION REPORT

Rail Occurrence Investigation No. 2006/004

Preliminary

Collision between

K100E Truck and Freight Train 4AM3

Lismore, Victoria

25 May 2006

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Abstract

At about 0714 on 25 May 2006 a Kenworth K100E truck and 'dog' trailer, loaded with 30 tonnes of citrus pulp, collided with the second locomotive of freight train 4AM3 at the Lismore to Skipton Road level crossing, Lismore, Victoria.

As a consequence of this collision the second and third locomotives, and 41 of the train's 64 wagons were derailed. The driver of the truck was fatally injured in the collision.

The investigation is continuing.

THE AUSTRALIAN TRANSPORT SAFETY BUREAU

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Transport and Regional Services. ATSB investigations are independent of regulatory, operator or other external bodies.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations. Accordingly, the ATSB also conducts investigations and studies of the transport system to identify underlying factors and trends that have the potential to adversely affect safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements. The object of a safety investigation is to determine the circumstances to prevent other similar events. The results of these determinations form the basis for safety action, including recommendations where necessary. As with equivalent overseas organisations, the ATSB has no power to implement its recommendations.

It is not the object of an investigation to determine blame or liability. However, it should be recognised that an investigation report must include factual material of sufficient weight to support the analysis and findings. That material will at times contain information reflecting on the performance of individuals and organisations, and how their actions may have contributed to the outcomes of the matter under investigation. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. While the Bureau issues recommendations to regulatory authorities, industry, or other agencies in order to address safety issues, its preference is for organisations to make safety enhancements during the course of an investigation. The Bureau is pleased to report positive safety action in its final reports rather than make formal recommendations. Recommendations may be issued in conjunction with ATSB reports or independently. A safety issue may lead to a number of similar recommendations, each issued to a different agency.

The ATSB does not have the resources to carry out a full cost-benefit analysis of each safety recommendation. The cost of a recommendation must be balanced against its benefits to safety, and transport safety involves the whole community. Such analysis is a matter for the body to which the recommendation is addressed (for example, the relevant regulatory authority in aviation, marine or rail) in consultation with the industry.

1 INTRODUCTION

The Australian Transport Safety Bureau (ATSB) initiated an independent investigation into the collision between a loaded K100E truck and 'dog' trailer, and a freight train at the Lismore to Skipton Road level crossing at Lismore, Victoria on 25 May 2006. The purpose of the investigation is to identify the causal factors leading to the accident with the intention of encouraging safety actions in order to prevent future accidents of this type.

Given the fatality of the truck driver and the danger to which the train crew was exposed, the ATSB has released this preliminary report to convey factual information and an interim recommendation to help mitigate the risk of another collision at this level crossing. Additional factual material and analysis will be included in the final report.

When completed, the final report will be released in accordance with the *Transport Safety Investigation Act 2003*. The investigation is continuing.

2 FACTUAL INFORMATION

2.1 The Occurrence

At about 0714[1] on Thursday 25 May 2006, a Kenworth K100E truck and 'dog' trailer, owned and operated by Wheelhouse Fertilisers Pty Ltd, collided with the second locomotive of Pacific National freight train 4AM3 while travelling 'south' along the Lismore to Skipton Road at Lismore, Victoria. The Lismore to Skipton Road level crossing is on the main standard gauge rail line between Adelaide and Melbourne, 168.209 kilometres from Spencer Street Station, Melbourne. The maximum speed for road traffic at this location is 100km/h; the maximum speed for rail traffic is 115 km/h.

The Kenworth K100E truck and trailer involved in the collision was 19 metres long from 'bull-bar' to the rear of the trailer and could operate at a maximum gross mass of 55 tonnes. On this occasion it was loaded with an estimated 30 tonnes of citrus pulp and was travelling from Mildura to Camperdown. The driver had rested while en-route at his residence at Wedderburn until 0340 on Thursday 25 May 2006.

Train 4AM3 consisted of three locomotives hauling 64 wagons for a total length of 1355.919 metres and gross mass of 4382 tonnes. The maximum permissible train speed for 4AM3 was 110km/h. This train was en-route from Adelaide to Melbourne and was crewed by a driver and an assistant. This crew had signed on at Dimboola at 0420 on Thursday 25 May 2006.

The force of the collision was such that the citrus pulp being carried by the truck was hurled about 60 metres to the opposite side of the level crossing. In addition, part of the truck's 'bull-bar' was imbedded in the side of the second locomotive.

1 The 24-hour clock is used in this report to describe the local time of day, Eastern Standard Time (EST), as particular events occurred. Eastern Standard Time is Coordinated Universal Time (UTC) + 10 hours.

Figure 1: Orange pulp on opposite side of collision

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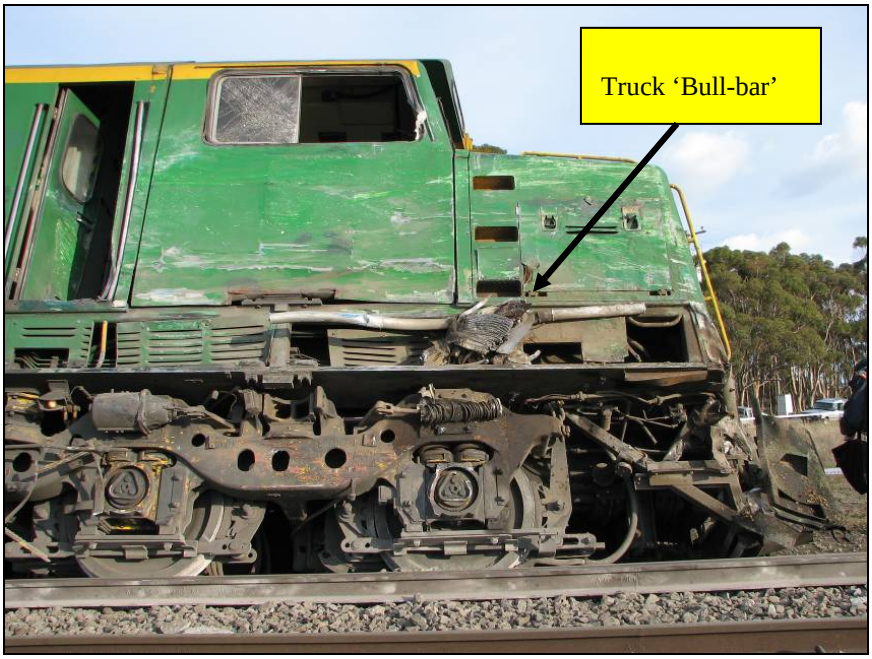
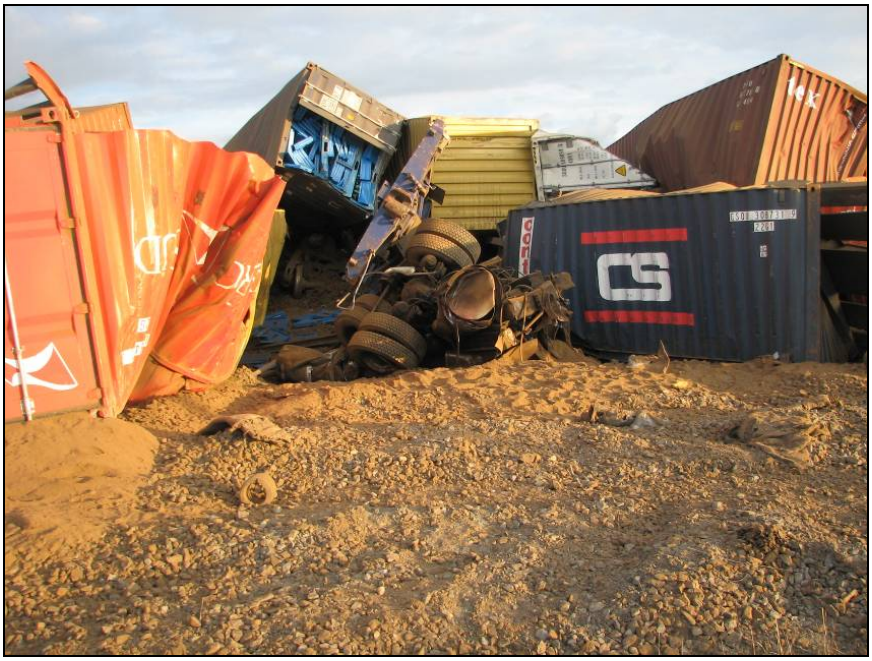
Figure 2: Bull-bar on second locomotive



At or shortly after impact, the lead and second locomotive broke away from the third locomotive and the rest of the train. Behind this break in the train, at some time during the derailment sequence the force exerted by the impact of the truck was overtaken by the 'in train' inertial forces which resulted in 41 of the train's 64 wagons being derailed. The derailed locomotive and wagons, normally a length of 844.8 metres, were subsequently compressed into a length of about 170 metres and spread to a width of 55 metres. The lead and second locomotives came to a stop about 70 metres clear of the train wreckage, 14.3 metres from the Lismore to Camperdown Road level crossing. The Lismore to Camperdown Road level

crossing is about 275 metres from the Lismore to Skipton Road level crossing. The infrastructure between the two level crossings was extensively damaged. The truck was broken into various pieces and was buried within the wreckage.

Figure 3: Wreckage and part of truck



There was no fire and train 4AM3 was carrying no dangerous goods as defined by the *Dangerous Goods Act 1975* (as amended). There was, however, an unknown amount of diesel fuel in the fuel tanks of the three locomotives and the truck.

2.2 Injuries

The driver of the truck was fatally injured. The two train crew were shaken, but otherwise unhurt.

2.3 Emergency response/site control

A member of the Victoria Police arrived on site about 20 minutes after the collision. Additional Police, personnel from the Ambulance, Country Fire Service and State Emergency Service arrived at the scene at varying intervals during the morning.

Emergency response during Thursday 25 May was primarily directed at trying to locate the driver of the truck. The following day Pacific National personnel, in consultation with emergency services personnel, took over the management of the accident site. The site control included the designation of a formal site entry point, signing in and out of all persons on a register, breath testing, site briefings and mandating personal protective equipment (including hard hat and glasses) for personnel on the site. In addition, security, first aid and toilet facilities were provided.

The track was re-opened at 0045 on Wednesday 31 May 2006. The total closure period was 137.5 hours.

3 KEY ISSUES

At this stage the ATSB investigation is progressively collecting and analysing information. Please note that this preliminary report in no way prejudices any conclusions that may be reached in the ATSB's final report into this accident.

3.1 Environmental conditions

Sunrise at Lismore on 25 May 2006 was at 0728. The minimum and maximum temperatures for the day were about 3 and 12 degrees Celsius respectively. The evidence from witnesses is unanimous in that the area was 'blanketed' in thick fog and visibility was said to be reduced to between 20 and 50 metres. The fog did not clear until much later in the day after the accident.

Figure 4: Fog around two lead locomotives, taken several hours after the collision

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3.2 Data logger readouts

An examination of the leading locomotive data logger reveals that on the approach to the Lismore to Skipton Road level crossing that train 4AM3 was travelling at 111 km/h. The locomotive horn was first sounded for about two seconds from 0714:12 to just after 0714:14. Four seconds later the locomotive horn was sounded a second time for a duration of about three seconds from 0714:19 to 0714:22. While sounding the horn at this time, a brake pipe reduction of 50 kPa[2] was initiated. Other evidence indicates that this brake application was to slow the train for a 65

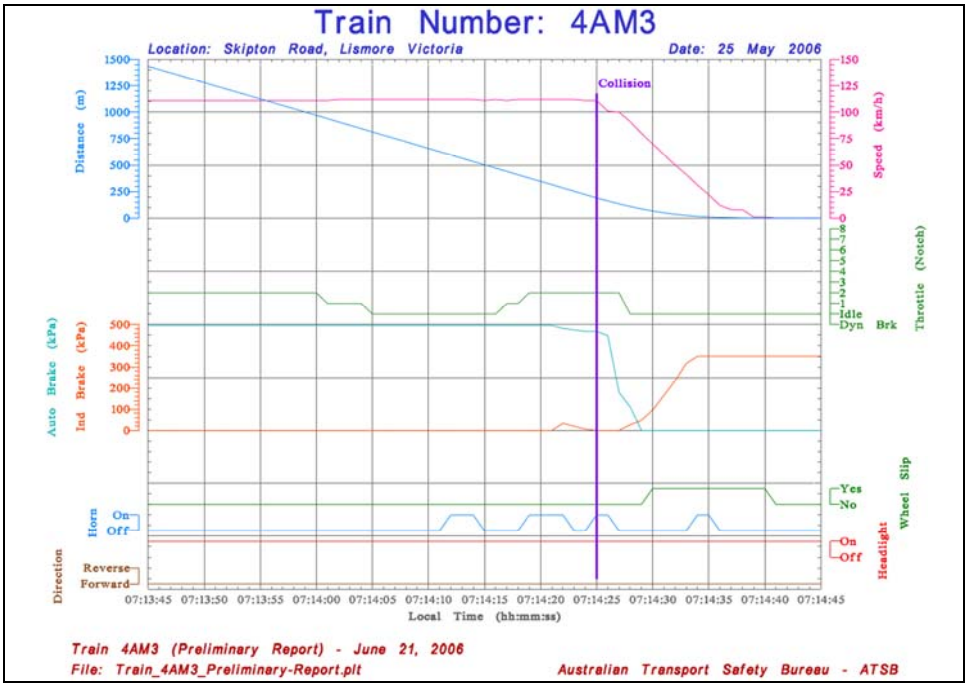
2 50 kPa brake-pipe reduction – An initial application of the train brakes. In this instance would indicate a routine brake application.

km/h temporary speed restriction that was about 2.5 kilometres away. A sudden reduction in speed and brake-pipe pressure was recorded about 3.5 seconds later at 0714:25. It is likely that this was when the collision occurred. At this time (0714:25) the horn again sounded for just over one second. The horn was then sounded, for the fourth time, seconds before the locomotive stopped 14.3 metres short of the Lismore to Camperdown Road level crossing.

The data logger records show that locomotive NR52 travelled a further 189 metres from the point of collision until it stopped. However, during the stopping sequence, the logger also recorded some wheel slip which may have affected the distance it recorded. This would mean that the distance recorded from the collision until stopping (189 metres) may be somewhat shorter than the actual distance travelled.

The locomotive headlight was recorded as being on throughout the accident sequence.

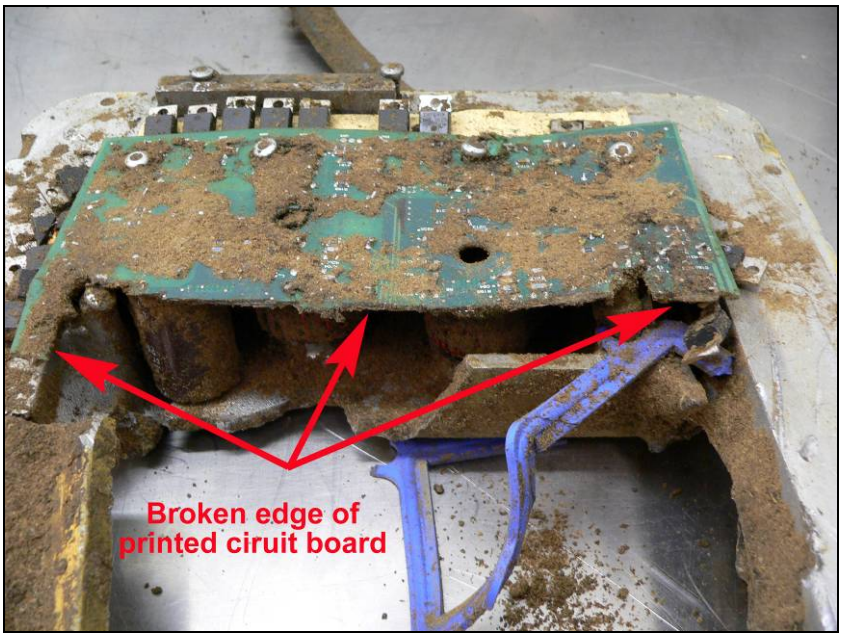
Figure 5: Locomotive data logger recording, NR 52



The speed of the truck and the actions of the truck driver are at this stage unknown.

An electronic control module from the truck involved in the level crossing accident at Skipton Road Lismore Victoria on 25 May 2006 was provided to the ATSB to determine if any electronic stored information could be recovered. Only a portion of the full module was recovered as shown in the following picture.

Figure 6: Electronic control module as received



The module was examined and there were no components that contained stored information.

3.3 Level crossing protection

The Lismore to Skipton Road level crossing is passively protected by warning signs on the approach to either side of the crossing. A give way sign and white clearance line painted on the road are located 8.5 metres from the track centre on the level crossing. Although not a factor in this instance, trees line either side of the rail line on the 'western' or Adelaide approach until 175 metres from the level crossing. If a train is travelling at the permitted 115km/h this gives road traffic 5.48 seconds in which an approaching train would be visible, weather conditions permitting.

Figure 7: Trees on the 'western' approach to the Lismore to Skipton Road crossing

It is also noted that this level crossing has been listed in the Department of Infrastructure Victoria, Level Crossing Upgrade Program for future upgrading from passive to active protection. The tender for this work was advertised in September 2005, awarded in December 2005 and completion scheduled for March 2007.

3.4 Skipton and Camperdown Road traffic patterns

The Lismore to Skipton Road is rated for B-Double usage. The evidence is that the majority of heavy vehicle transport use the road rather than the Lismore to Camperdown Road as this route is shorter and by-passes the Lismore township and several sharp bends. The Lismore to Camperdown level crossing is protected by flashing lights and audible warning devices. The Lismore to Skipton and Lismore to Camperdown roads converge at a junction to the 'south' of these level crossings. The distance between the two level crossings by rail is 275 metres.

3.5 The investigation

The investigation is continuing.

4 SAFETY ACTIONS

The ATSB investigation makes the following interim recommendation with the intention of improving railway operational safety. ATSB recommendations are directed to those agencies that should be best placed to action the safety enhancements intended by the recommendations, and are not necessarily reflective of deficiencies within those agencies or related to accident causality.

4.1 Recommendation

RR20060034

The Australian Transport Safety Bureau recommends that the Australian Rail Track Corporation and VicRoads review the level of short term protection provided[3] at the Lismore to Skipton Road level crossing, particularly noting the limited visibility of approaching trains to motorists at or approaching this crossing.

3 The ATSB has noted that this crossing is scheduled for upgrade to active protection early in 2007.